Suisun Marsh Monitoring Program
Channel Water Salinity Report

Reporting Period: October 2011

Questions regarding this report should be directed to:

Bill Burkhard
California Department of Water Resources
Division of Environmental Services
3500 Industrial Blvd
West Sacramento, CA 95691

Telephone: (916) 376--9761
burkhard@water.ca.gov

TABLE OF CONTENT

4. List of Figures

2. Monitoring Results

2.1 Channel Water Salinity Compliance

During the month of October, 2011, all five compliance stations were in compliance with channel water salinity standards of SWRCB (Table 1). Compliance with standards for the month of October was determined for each compliance station by comparing the progressive daily mean of high-tide SC with respective standards. The standard for all the compliance stations were 19.0 mS/cm during October 2011. Table 1 lists monthly mean high-tide SC at these compliance stations. The progressive daily mean (PDM) is the monthly average of both daily high-tide SC values. The mathematical equation is shown below.

$$PDM = \frac{\sum \text{daily average of high tide SC}}{\text{\# days of the month}}$$

2.2 Delta Outflow

Outflow for October 2011 was above normal this time of year. The first half of the month was above 10,000 cfs and the later half was between 5,000 cfs and 10,000 cfs. Typically, daily outflow during this month is less than 5,000 cfs. The early precipitation activity in the early half of October resulted in outflow above 14,000 cfs as shown in Figure 3. Thereafter, outflow index dropped due to no precipitation, but outflow still remains above 5,000 cfs at the end of the month due to antecedent wet conditions and a cool summer. The monthly Delta outflow is represented by the mean Net Delta Outflow Index (NDOI). The NDOI is the estimated daily average of Delta outflow. Mean NDOI for October 2011 is listed below:

Month	Mean NDOI (cubic feet per second)
October	12,154

2.3 Rainfall

Precipitation data are located in Fairfield, CA, and by the Fairfield Suisun Water Treatment Plant. October 2011 had several rainfall events, all of which occurred at the first half of the month as shown in Figure 3. The largest rainfall amount occurred on October 5, 2011 with a daily total of 0.6 inches and the second largest rainfall occurred two days later, with a daily total of about 0.5 inches. There were additional rainfall, but all of them had daily amounts below .30 inches. Overall, the amount was small overall. The monthly total is shown below:

Month	Total Rainfall (inches)
October	1.65

2.4 Suisun Marsh Salinity Control Gate (SMSCG) Operations

Operations and flashboard/boat lock installations at the SMSCG during October 2011 is summarized below.

Date	Gate status	Flashboards status	Boat Lock status
October 1 – 20	3 Open	Out	Closed
October 21 – 31	3 Open	In	Closed

In anticipation of any salinity concerns during the control season, the flashboards were installed on October 21, 2011 by contractors at the request of DWR, DFD with radial gates open and boat lock gates closed due to safety concerns. DWR is in contact with the NOAA about the matter at this time. Salinity levels in October at all compliance and monitoring stations were not of concern, thus the radial gates were not operated tidally during this month.

3. Discussion

3.1 Factors Affecting Channel Water Salinity in the Suisun Marsh

Factors that affect channel water salinity levels in the Suisun Marsh include:

- delta outflow;
- tidal exchange;

- rainfall and local creek inflow;
- managed wetland operations; and,
- operations of the SMSCG and flashboard configurations.

3.2 Observations and Trends

3.2.1 Conditions during the Reporting Period

During October 2011 PDM salinity levels at Collinsville(C-2), National Steel(S-64), Beldons (S-49), and Volanti(S-42) ranged was no higher than 8.0 mS/cm as shown in Figure 1. Salinity levels at all compliance stations were stable for the most part in October. The early October rainfall events resulted in higher than usual outflow for this time period brought salinity downward by a hair at S49, S21, and S42, but appears to be ineffective at S64 and C-2B.

Monitoring stations, S97 and S35 salinity levels were also stable for the most part and took a slight dip downward mid-October. What's interesting is that salinity at S35 is lower than S97, and could be attributed to the early high outflow since S35 is closer to the Bay and is more influence by outflow than creek flows. Creek flows response is more apparent at S97, and perhaps the early October precipitation was not active in the area nor the amount to result in high creek runoff to impact salinity at S97.

Overall, salinity levels in October 2011 were at least 8 mS/cm or more below the monthly standard at all compliance stations.

3.2.2 Comparison of Reporting Period Conditions with Previous Years

Monthly mean high-tide SC at the compliance and monitoring stations for October 2011 were compared with means for those months during the previous nine years (Figure 4).

Mean salinity pattern of all compliance and monitoring stations resembles that of 2005 in salinity patterns among the stations but much lower as shown in Figure 4. Compared to previous nine years, October 2011 salinity levels were ranked tenth in high Specific Conductance or lowest salinity levels. 2011 October came off a wet year and cool summer with early small amount of precipitation activities that were enough to hold salinity down and remains to be the lowest compared to the past nine years.

Table 1

Monthly Mean High Tide Specific Conductance at Suisun Marsh Water Quality Compliance Stations

October 2011

Station	Specific Conductance (mS/cm)*	Deficiency Standard	Deficiency Standard meet?
C-2**	0.8	19.0	yes
S-64	2.5	19.0	yes
S-49	6.3	19.0	yes
S-42	6.5	19.0	Yes
S-21	6.7	19.0	Yes

*milliSiemens per centimeter

**The representative data from nearby USBR station is used in lieu of data from station C-2.

Figure 1. Suisun Marsh Progressive Mean High Tide Specific Conductance for October 2011

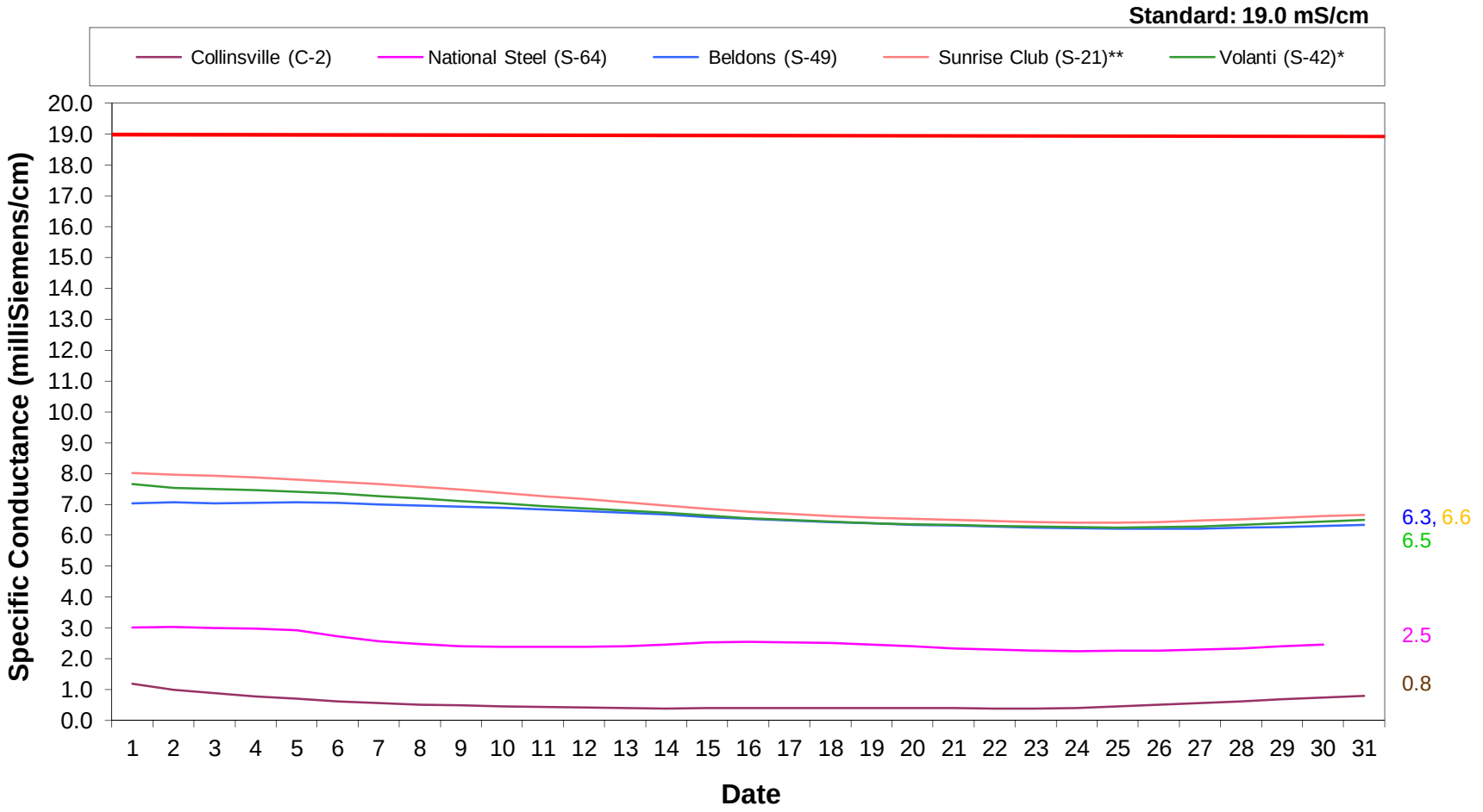


Figure 2. Suisun Marsh Progressive Mean High-Tide Specific Conductance For October 2011

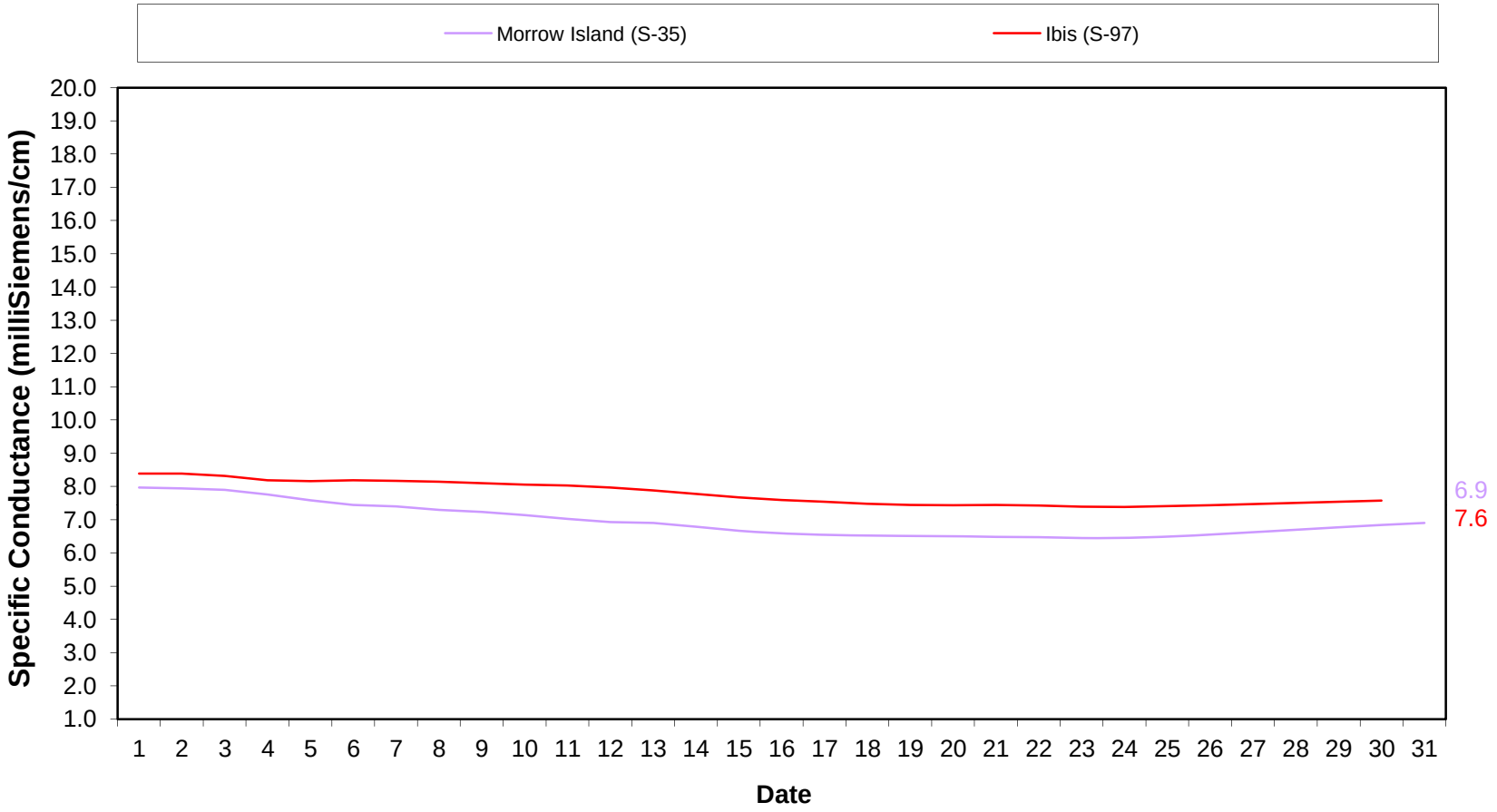
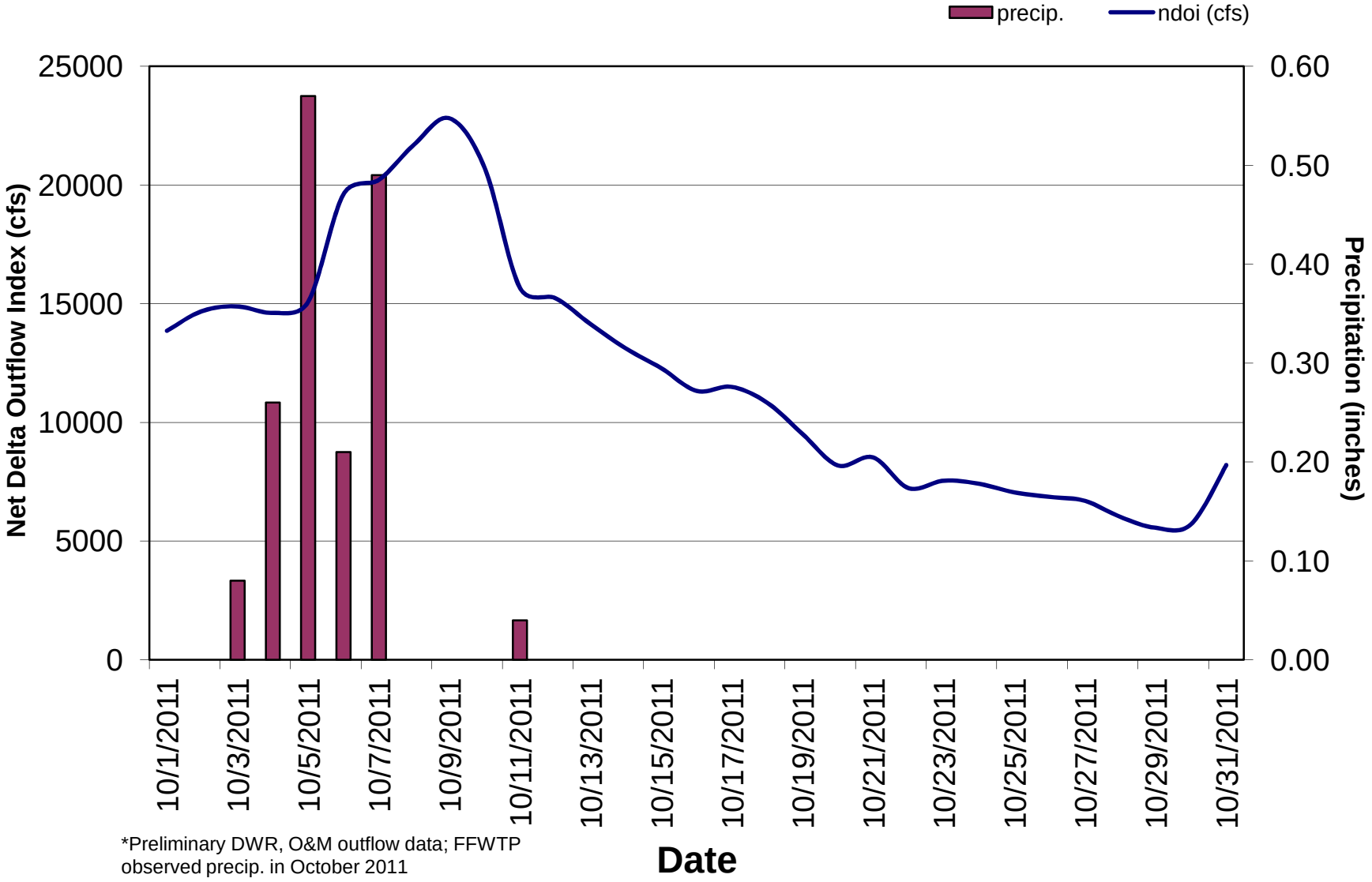
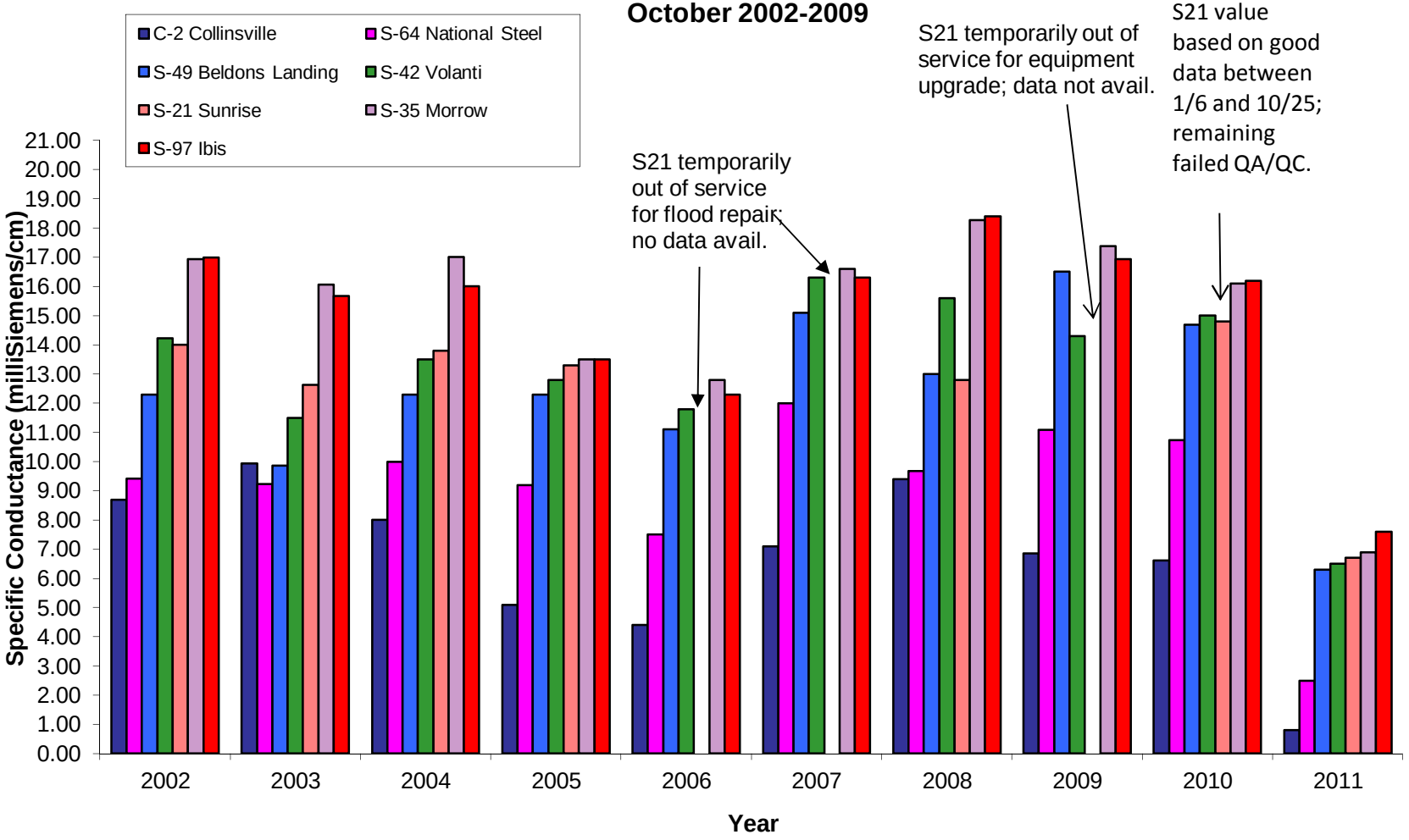


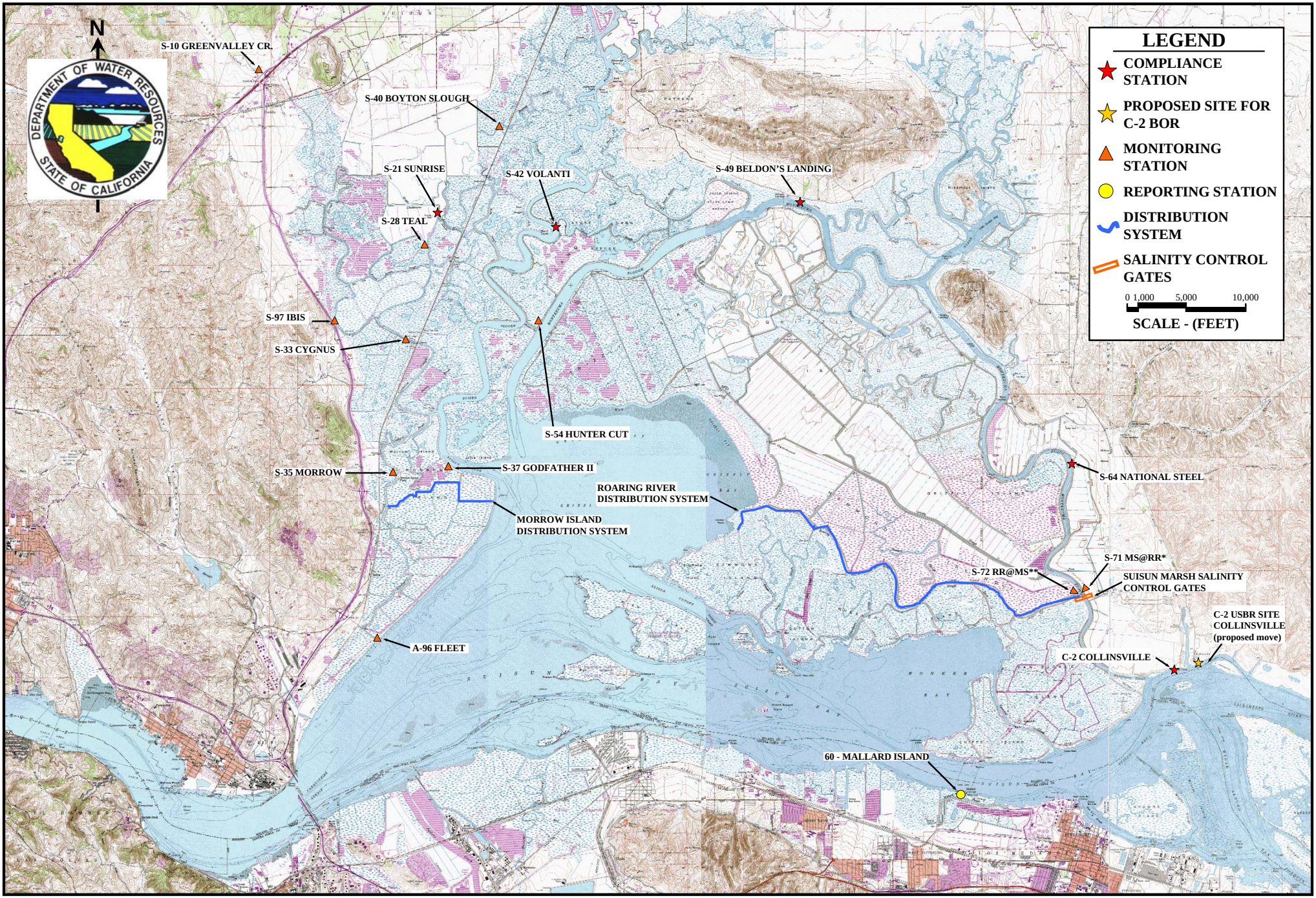
Figure 3. Daily Net Delta Outflow Index and Precipitation*
October 2011



*Preliminary DWR, O&M outflow data; FFWTP observed precip. in October 2011

Figure 4. Monthly Mean Specific Conductance at High Tide: Comparison of Monthly Values for Selected Stations October 2002-2009





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